NextGen Detroit Metropolitan Wayne County Airport

Detroit Metropolitan Wayne County Airport (DTW) is the 18th busiest airport in North America in terms of passenger traffic. In 2014, 32.5 million passengers traveled through DTW, an increase of 0.4 percent from 2013. The number of operations decreased 7.8 percent to 392,635.

In 2014, DTW was the 27th busiest airport in North America in terms of cargo volume with 202,032 metric tons of cargo passing through its facilities. The airport is Delta Air Lines' second busiest hub. Delta, along with SkyTeam partner Air France, and codeshare partner Virgin Atlantic, use DTW as a primary gateway to Asia from the eastern United States. DTW is America's third-busiest gateway to Europe.

All airport information shown above is reported by Calendar Year (CY).

NextGen Capabilities

Airport Surface Detection Equipment- Model X (ASDE-X)
Sumer 2008
Area Navigation (RNAV) Global Positioning System (GPS) Approaches
9/2008
External Surface Data Release
FY 2011
Expanded Low-Visibility Operations Using Lower Runway Visual Range (RVR) Minima
8/2011
Expanded Low-Visibility Operations Using Lower Runway Visual Range (RVR) Minima
7/2013
Deployment of Time Based Flow Management (TBFM)
by 8/2013
Expanded Low-Visibility Operations Using Lower Runway Visual Range (RVR) Minima
12/2013
Expanded Low-Visibility Operations Using Lower Runway Visual Range (RVR) Minima
4/2014
Expanded Low-Visibility Operations Using Lower Runway Visual Range (RVR) Minima
9/2014
Wake Turbulence Mitigation for Arrivals-Procedures (WTMA-P) for Heavy/757 Aircraft
CY 2015
Situational Awareness and Alerting of Ground Vehicles
2/2015
- Featured capabilities have extended descriptions.

This timeline reflects programmatic milestones and excludes capabilities implemented across the National Airspace System.

Information as of September 15, 2016.

Airport Surface Detection Equipment- Model X (ASDE-X)

Learn more about ASDE-X in the Automatic Dependent Surveillance-Broadcast section of the 2017 NextGen Update.

Read how ASDE-X is used at other locations in the National Airspace System.

Area Navigation (RNAV) Global Positioning System (GPS) Approaches

Read how RNAV GPS Approaches and other NextGen technology are used at other locations in the National Airspace System.

External Surface Data Release

Read how surface data sharing is used at other locations in the National Airspace System.

Expanded Low-Visibility Operations Using Lower Runway Visual Range (RVR) Minima

Read how expanded low visibility operations have impacted the National Airspace System.

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Deployment of Time Based Flow Management (TBFM)

What is Time Based Flow Management?

Time Based Flow Management (TBFM) is a capability used to manage traffic flows by metering, or sequencing aircraft to their arrival airports. Through TBFM, an automation system uses a schedule of runway assignments and landing times to sequence inbound flights, and allocates delays to various segments of each flight in order to meet the assigned schedule. TBFM is administered by traffic managers at the Air Route Traffic Control Center (ARTCC) of the arrival airport. For some airports, TBFM is used routinely, while at others it is used as needed.

TBFM provides four time-based metering functions:

- Arrival management/situational awareness to inform traffic managers of projected arrival demand
- Airborne metering to sequence flights and provide controllers with allocated delay assignments for each flight to meet the proposed schedule
- Departure scheduling to provide increased management of arrival demand by assigning delays to flights at their origin airports, helping them to better merge into the arrival stream
- En route departure capability to efficiently integrate departures into overhead en route streams

TBFM enables the more efficient use of available capacity by tailoring the allocation of delays to individual flights, thereby reducing the need for less efficient "one-size-fits-all" techniques such as Miles-in-Trail restrictions. In turn, this can reduce total aircraft delays, and transfer delays to more fuel-efficient phases of flight, such as on the ground or at higher altitudes.

The transfer of delays out of the terminal approach area positions inbound flights to take advantage of Optimized Profile Descent procedures, where these have been implemented. The use of TBFM varies significantly by location, reflecting differences in operating environments and air traffic management strategies.

Time Based Flow Management

How is TBFM used for Detroit?

Time Based Flow Management has been used regularly since 2010 for departure scheduling for arrivals to Detroit Metropolitan Wayne County Airport (DTW). The Cleveland Air Route Traffic Control Center (ZOB) manages metering to DTW, scheduling departures about 5 hours per day during periods of high demand. Adjacent Air Route Traffic Control Centers provide support. Airborne metering — a process air traffic controllers use to deliver arrivals at scheduled times — is not used for DTW arrivals.

When was it implemented?

A predecessor of TBFM, called Traffic Management Advisor (TMA), was developed and implemented in the 1990s. TMA was deployed at all 20 ARTCCs by 2007 and

was modernized as TBFM in 2013 as a result of a major system re-architecture.

How did it impact operations?

The FAA conducted an operational assessment of two Time Based Flow Management (TBFM) functions, airborne metering and departure scheduling, at eight airports — four per function — where these are used widely, including Detroit Metropolitan Wayne County Airport (DTW). The locations were selected based on how frequently each function is used alone and in combination, so the impact of each function could be measured. For this reason, results cannot be interpreted to be representative of impacts at other locations.

For each function, the assessment looked at the impact on arrival and airborne delays as indicators of how efficiently the available capacity was used. The FAA's assessment of flights between July 2011 and December 2013 found:

- At three out of four airports studied that use departure scheduling, arrivals experienced 1.0 to 1.3 minutes shorter arrival delay when the facility used this TBFM function. Arrivals to DTW see nearly all of this reduction on the ground.
- With few exceptions, departure scheduling also significantly reduced the variability of delays.
- Compared to metered flights to the four airports included in our study, flights subject to Miles-in-Trail (MIT) restrictions alone accumulate eight to ten minutes longer arrival delays. It is unclear, however, how much of this difference can be attributed exclusively to TBFM because much of the difference occurs on the ground, and there could be other contributing factors.
- Metered flights experienced about a minute shorter airborne delay than those subject to MIT restrictions, as well as less extreme and more predictable airborne delays.

Click here for a full description of the NextGen Operational Performance Assessment.

What is the value of this improvement?

The FAA estimates the combined reductions in aircraft delays for the eight airports evaluated translated to about $640 million in savings between 2011 and 2014 (expressed in 2015 dollars). These savings reflect reduced operating costs to airlines of $209 million, and time savings to passengers valued at over $430 million. The estimate applies the average observed per-flight delay savings to the base of arrivals managed by airborne metering or departure scheduling, in accordance with the FAA's performance assessment.

Where else is it implemented?

Time Based Flow Management (TBFM) is deployed at 93 facilities across the National Airspace System (NAS), including 20 en route, 28 terminal, and 45 tower facilities. It is deployed at all but two Core 30 airports, with Tampa International Airport (TPA) and Honolulu International Airport (HNL) as the two exceptions.

Read how Time Based Flow Management (TBFM) is used at other locations in the National Airspace System.

Additional information available on the NextGen Portfolio pages.

Expanded Low-Visibility Operations Using Lower Runway Visual Range (RVR) Minima

Read how expanded low visibility operations have impacted the National Airspace System.

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Situational Awareness and Alerting of Ground Vehicles

Read more about System Wide Information Management (SWIM).

Scorecard

The following metrics summarize performance over a large set of diverse operations at this location. As such, their purpose is to reflect general trends as experienced by aircraft operators and passengers, without regard to their underlying drivers. For this reason, metric values should not be compared to operational impacts attributed to specific NextGen capabilities, where these are provided.

Reportable Hours for DTW
06:00 - 22:59 local time

All Information below is in Fiscal Years (October 1 - September 30).

- Efficiency
- Capacity

Efficiency Performance Indicators

Performance Indicator (FY)	2009	2010	2011	2012	2013	2014	2015	2016
Average Gate Arrival Delay *Minutes per Flight* **During reportable hours, the yearly average of the difference between the Actual Gate-In Time and the Scheduled Gate-In Time for flights to the selected airport from any of the ASPM airports. The delay for each fiscal year (FY) is calculated based on the 0.5th — 99.5th percentile of the distributions for the year. Flights may depart outside reportable hours, but must arrive during them. The reportable hours vary by airport.**	1.3	3.2	2.2	-2.0	-0.1	0.2	1.7	-1.6
Average Number of Level-offs per Flight *Counts per Flight* **The count of level-offs as flights descend from cruise altitudes to the arrival airport, averaged for the fiscal year.**	1	1	3.0	2.9	2.8	2.8	2.9	2.8
Distance in Level Flight from Top of Descent to Runway Threshold *Nautical Miles per Flight* **The distance flown during level-off segments as flights descend from cruise altitudes to the arrival airport, averaged for the fiscal year (FY).**	1	1	48.0	46.9	46.7	46.4	47.7	45.3
Effective Gate-to-Gate Time *Minutes per Flight* **During reportable hours, the difference between the Actual Gate-In Time at the destination (selected) airport and the Scheduled Gate-Out Time at the origin airport. Flights may depart outside reportable hours, but must arrive during them. The reportable hours vary by airport and the results**	117.2	121.4	132.6	134.2	120.0	124.4	128.4	127.4

are reported by fiscal year (FY).								
Taxi-In Time ***Minutes per Flight*** **During reportable hours, the yearly average of the difference between Wheels-On Time and Gate-In Time for flights arriving at the selected airport from any of the Aviation System Performance Metrics (ASPM) airports. Flights may depart outside reportable hours, but must arrive during them. The reportable hours vary by airport.**	11.1	10.9	9.5	8.6	8.6	7.8	7.6	7.3
Taxi-Out Time ***Minutes per Flight*** **During reportable hours, the yearly average of the difference between Gate-Out Time and Wheels-Off Time for flights from the selected airport to any of the ASPM airports. Flights must depart during reportable hours, but may arrive outside them. The reportable hours vary by airport.**	21.1	21.1	19.7	18.4	20.6	18.8	18.4	18.1

[1] Consistent data for the time period prior to FY 2011 are not available.

As described by the International Civil Aviation Organization (ICAO), *efficiency addresses the operational and economic cost-effectiveness of gate-to-gate flight operations from a single-flight perspective. In all phases of flight, airspace users want to depart and arrive at the times they select and fly the trajectory they determine to be optimum.*

Capacity Performance Indicator

Performance Indicator (FY)	2009	2010	2011	2012	2013	2014	2015	2016
Average Daily Capacity ***Number of Operations*** **During reportable hours, the average daily sum of the Airport Departure Rate (ADR) and Airport Arrival Rate (AAR) reported by fiscal year (FY). The reportable hours vary by airport.**	2,517	2,598	2,598	2,555	2,430	2,696	2,384	2,491
Average Hourly Capacity During Instrument Meteorological Conditions (IMC) ***Number of Operations*** **The average hourly capacity reported during IMC weather conditions (as defined by ASPM). Capacity is defined as the sum of Airport Departure Rate**	143	147	150	153	141	146	139	142

(ADR) and Airport Arrival Rate (AAR). It is calculated based on the reportable hours at the destination airport. The reportable hours vary by airport.								

As described by the International Civil Aviation Organization (ICAO): *The global Air Traffic Management (ATM) system should exploit the inherent capacity to meet airspace user demands at peak times and locations while minimizing restrictions on traffic flow. ICAO also notes: The ATM system must be resilient to service disruption and the resulting temporary loss of capacity.*

Additional Links

NextGen Implementation Plan